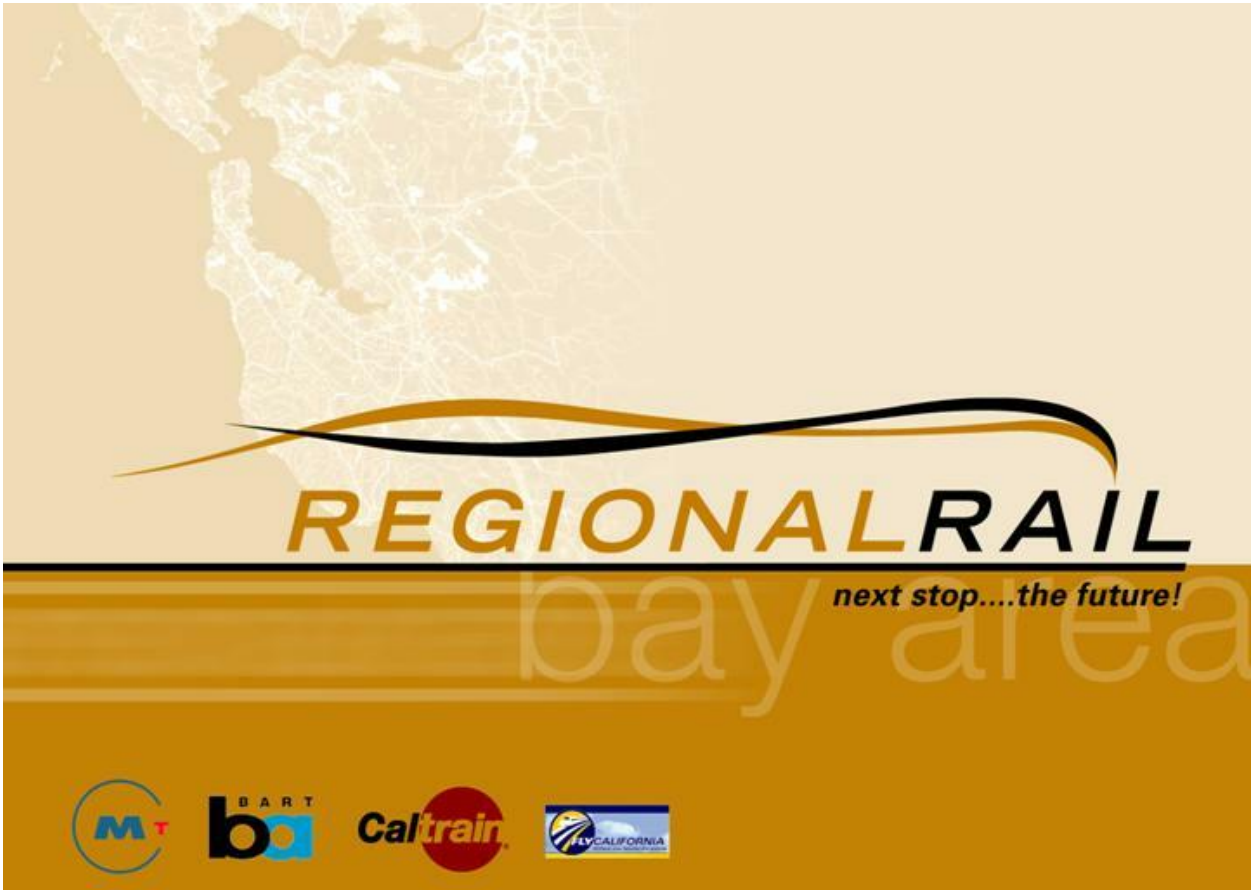
BAY AREA REGIONAL RAIL PLAN
CONCEPTUAL ALTERNATIVES TASK

Technical Memorandum 4.l

Local and Regional Transit Connections Study



April 12, 2007

EarthTech
A tyco International Ltd. Company
DMJM HARRIS | AECOM

SCOPE OF WORK

CONSULTANT shall develop a local and regional transit connections plan, building on the RM2 Transit Connectivity Study, and including integration plans for sub-regional light rail services such as those operated by the San Francisco Municipal Railway (Muni) and the Santa Clara Transportation Authority (VTA).

In addition to other proposed links, this plan shall include proposals for connections between the proposed regional rail service in Sonoma and Marin Counties, and other regional and local services in the Bay Area.

INTRODUCTION

Existing Bay Area transit services could be described as a patchwork of networks of different modes operated by numerous agencies. The regional rail system of the future would focus on developing trunk lines of high-quality rail services that tie the networks of local services together, creating a truly regional transit network. The success of such a network inherently depends on reliable connections – not only between the regional rail lines themselves, but especially between the regional rail system and local transit services.

This study outlines the specific connectivity issues that must be considered as the regional rail system is implemented. The first portion of the study develops the criteria contributing to the quality and success of transfer points. The second portion identifies and describes the connectivity points of the future regional rail network.

QUALITY OF CONNECTIVITY POINTS

For the transit rider, transfers are generally an unwelcome portion of the journey. However, if they cannot be completely avoided, transfers can be made as seamless as possible. The wide range in the quality of transfers between different transit services can be evaluated with respect to four areas of consideration: cost and payment, travel times and schedule reliability, transfer times and physical connectivity.

Cost and Payment

The cost and inconvenience of paying a second fare are deterrents to the transferring transit rider. Free transfers are generally only available between the lines of a single operator; generally a second fare must be paid to transfer to the service of another transit provider. Discounts are available in many cases, but are often not widely publicized or especially convenient.

Cost

The implementation of a regional rail network provides a framework around which other transit services would be oriented. The current system of offering discounts for transferring passengers could be continued, with a ticket or transfer from one service, along with payment of a discounted fare, being accepted on another service.

Alternatively, a zone-based fare system for the regional transit network could be introduced, offering the most convenience. Such a system would establish a comprehensive, distance-based fare system for the Bay Area that would be blind to mode or service provider. Such a universal fare structure would remove transfer fare penalties, but would require reciprocal agreements between service providers to distribute fare revenue among them.

Payment

Aside from the cost that might be associated with making a transfer, retaining ticket stubs or remembering to request transfer slips can be inconvenient. Transfer policies can be confusing and inconsistently enforced. Whether the current arrangement of offering transfer discounts is continued or a zone-based fare system is established, the introduction of smart cards would replace paper transfer media and remove the guesswork from making transfers. The *TransLink* smart card, now being introduced, is designed to automatically apply discounts when used for a trip involving transfers, and could easily be adapted for a zone-based fare system as well. A *TransLink* or similar smart card fare payment system is essential to providing the high-quality connectivity a regional rail system would require.

Input from the public and transit agencies would be considered to develop the optimal system. It is beyond the scope of this study to establish transfer policies and discounts or fare structures on a regional level, but the cost and inconvenience associated with making transfers should be minimized to the extent possible. The pricing of transit services cannot be divorced from the mechanisms that finance and fund them. Revenue enhancements, such as location-specific subsidies, could provide funding that would support more transfer-friendly fare policies.

Travel Times and Schedule Reliability

Travel time is one of the most important considerations factoring into a decision on whether or not to complete a trip by transit, and transit riders are generally willing to pay a premium fare for higher speed services. The average speed of transit vehicles ranges from approximately 8 mph for buses; 12 mph for bus rapid transit services; 15-25 mph for light rail; to 35-55 mph for rapid transit and commuter rail. Regional rail services would operate at the upper end and beyond this range, increasing transit's attractiveness.

Existing rail services often do not operate at their full potential of speed and reliability, largely due to the shared nature of the passenger/freight network. The same elements that allow higher speeds also increase a transit service's schedule reliability. The following are improvements that can be made to achieve this higher potential, in order of increasing cost and complexity:

- Improved signaling systems, allowing trains to operate at closer spacing and at higher speeds
- Crossovers and sidings to allow faster trains (typically carrying passengers) to pass slower trains (generally freight runs)
- Adding additional track to address capacity shortfalls
- New alignments to allow faster speeds

- Grade separations

At the least-improved end of the existing Bay Area rail network are services which share infrastructure with significant freight traffic and strained capacity. These services operate at relatively slow speeds and are subject to recurring delays. BART represents the most-improved end of the spectrum, as it operates entirely on its own right-of-way and for which signaling is controlled by a central computer system.

As a result, BART has high reliability and on-time performance, which are essential to establish schedule coordination. BART's service area, however, is limited to a few corridors in four of the nine Bay Area counties. As a result, schedule coordination on a regional level would be difficult to achieve, given existing conditions.

The implementation of regional rail services would include infrastructure upgrades to improve reliability. These particular investments are not addressed here, but their cumulative effect would result in improved schedule reliability and the ability to manage transfers more effectively.

Transfer Times

Each transit line operates according to a schedule reflecting travel speed, stops and service frequency, which differ from line to line. Schedule coordination refers to efforts to minimize delay for passengers transferring between transit lines. Schedule coordination is most important when a connection is being made to a less frequent service, during off-peak periods, or to the last trip offered during the service day.[1]

Three schedule coordination strategies can be implemented, depending on the services involved: pulse schedules, directional schedule coordination, and dependent linked schedules.

Pulse Schedules

At a station or stop with a pulse schedule, transit lines converge at regular intervals at a hub and depart after a 3-5 minute period during which transfers can be made. A *simultaneous* pulse schedule includes all lines serving the station at each "pulse", while a *staggered* or *alternating* pulse schedule includes only certain lines operating in different patterns. For example, less frequent lines would skip every other pulse; thus, only every other pulse would include all lines.

Pulse scheduling facilitates convenient transfers between many origin and destination pairs, in multiple directions of travel. However, the waiting period required lengthens travel times for through passengers. For this reason, it is ideal for lines to terminate at the pulsed-schedule hub, as the waiting period is simply absorbed into end-of-line layovers.

Pulse schedules would be implemented at regional rail and BART stations that serve as hubs of local transit services. Because of their location, generally in downtown areas or near activity centers, regional rail or BART stations are obvious choices for local transit hubs. At urban stations, where frequent service is provided on local routes (e.g. 4th & Townsend or Oakland Coliseum), pulse scheduling is not important: local transit lines operate at short headways and waiting times for transferring passengers are minimal.

However, at suburban stations, or in cases where base headways are greater than 15-20 minutes, pulse scheduling is desirable. The local transit services would be scheduled to

[1] MTC Transit Connectivity Plan, 3-10

converge at the station at regular intervals. Lines would either terminate at these stations, or observe a 3-5 minute period to allow transfers to be completed.

In some cases, the pulse concept would be applied between regional rail services themselves. During off-peak hours, BART trains pulse at MacArthur Station to facilitate transfers in all directions. Napa Junction is an example where two less frequent lines would cross; trains would be scheduled to arrive within short intervals, during which they would be held to allow transfers to take place. San Rafael, Stockton, Modesto and Pajaro/Castroville would also be served only by less frequent lines and would benefit from pulse scheduling.

Directional Schedule Coordination

At stations where pulse scheduling is implemented for local services, the pulses would be timed to match regional rail schedules. Because rail service would not generally observe a 3-5 minute period to allow transfers to local services, trains operating forward in the peak direction of travel would be scheduled to depart after the pulse period. It follows that local transit services operating forward in the peak direction of travel would "pulse" directly following train arrivals.

This is referred to as directional schedule coordination, where service on less frequent lines is coordinated with higher frequency service to assure that connections are made. This type of schedule coordination has the advantage of not requiring the services involved to be held for each other, as in the case of pulse schedules. However, it affords convenient transfers only in one direction of travel – from service A to service B, but not from service B to A. Transferring passengers in the opposite direction of the coordinated schedule would face longer waits.

BART service and some regional rail lines (the Caltrain corridor between San Francisco and San Jose, and the Capitol Corridor between Sacramento and San Jose) would generally operate at headways shorter than 15-20 minutes, making schedule coordination between these services irrelevant. However, services operating on lines interfacing with these corridors would have to be coordinated to avoid excessive waits for transferring passengers.

At stations served by multiple regional rail lines, trains operating at less frequent headways would be scheduled to coordinate with higher-frequency lines, as it would be undesirable to hold a through-running train. A train operating in the peak direction of travel on a less-frequent route would be scheduled to depart shortly after the arrival of higher-frequency services. Stations where directional schedule coordination may be desirable include: Sacramento, Fairfield/Vacaville, Richmond, Union City, Centerville, Irvington, San Jose and Tracy. Direct schedule coordination would also be beneficial at regional rail stations served by light rail, such as: Bayshore (Muni Metro); Mountain View, Great America, Capitol, I-880/Milpitas (VTA light rail); University/65th (Sacramento RT).

Dependent Linked Schedules

The regional rail network would include a number of feeder services, which act essentially as the continuation of another, terminating service. These services avail the opportunity for dependent linked schedules, which have the opportunity of reducing transfer times to an absolute minimum. When one transit vehicle arrives, the second vehicle is having a layover and can immediately receive transferring passengers. However, this requires high reliability on the part of both services and delays on one line would affect service along the line in the forward direction of travel.

The following transfer situations are identified as candidates for dependent linked schedules:

- Pittsburg/Bay Point: BART and eBART; BART and Vasco Road Express Bus
- Martinez: BART and I-680 Express Bus (Alt. 1)
- San Rafael: SMART/North Bay services and San Rafael–Daly City Express Bus; SMART/North Bay services and San Rafael–Richmond Express Bus (Alt. 1 only)
- Larkspur (Alt. 1) / San Quentin (Alt. 2): SMART service and SF ferry
- Saint Helena: Calistoga–Saint Helena feeder bus and North Bay service
- Vallejo Ferry Terminal: North Bay service and SF ferry
- Greenville Road (Alt. 1) / Isabel Avenue (Alt. 2): BART and Vasco Road Express Bus
- Gilroy: mainline service and Hollister shuttle (Alt. 1) or Salinas service (Alt. 2)
- Pajaro and Castroville: Salinas service and Wharf-to-wharf service

Physical Connectivity

Particularly where the services of different transit operators are concerned, the accompanying infrastructure may not have been designed with transferring passengers in mind. Thus, transfers may range from a cross-platform situation to those that require changes in level and a substantial walk between platforms and stops. Passengers with disabilities in particular may face considerable obstacles in transferring from one mode to another.

The principal connectivity points of the regional transit network described later in this study describe four types of physical connectivity, listed in order of increasing convenience:

- Extended walk or shuttle connection: in this situation, a platform or stop may be located blocks away from a corresponding platform or stop. Transferring passengers typically must move from an indoor to an outdoor environment, or vice versa. The transfer may involve crossing streets or taking a short ride on a shuttle bus or peoplemover in order to get from one to the other.

- Concourse connection: in this situation, the transfer takes place within an "indoor" environment (though it may be open to the elements) or its immediate surroundings. The paths of transferring passengers do not cross streets, though they typically include changing levels (a vertical component) and passage through concourses, halls, or other passages (a horizontal component).

- Direct vertical connection: unlike the concourse connection, this transfer involves a minimal or no horizontal component, only a change in levels.

- Cross-platform transfer: for this transfer, passengers get off one vehicle and transfer to another on the opposite side of the same platform, or board a vehicle that arrives later on the same side of the platform or at the same stop.

DESCRIPTION OF CONNECTIVITY POINTS

The future regional rail network would be based upon the existing transit networks, and today's connectivity points would continue in that function in the future. However, the addition of new services would require relocation of connectivity points and significant restructuring of local

transit services. These changes are outlined below, followed by descriptions of each principal connectivity point of the future regional rail network.

Relocation of Connectivity Points

Connectivity points of regional significance are typically located at the terminal stations of rail lines. At these points, buses reaching a wider service area feed into the rail network. As this network expands and new stations serve as terminals, these stations will assume the role of connectivity points, as described in the table below:

Current Connectivity Point	Regional Rail Connectivity Point
Richmond present BART terminus	**North Hercules (Alt. 1 only)** In Alt. 1, BART would be extended to North Hercules, which would intercept some bus services. Richmond would, however, remain as a principal connectivity point.
Fremont present BART terminus	**Union City, Irvington/Warm Springs (Alt. 2 only)** With BART no longer terminating in southern Alameda County, BART stations that are shared with Regional Rail replace Fremont as connectivity points.
Dublin/Pleasanton present BART terminus	**Greenville Road (Alt. 1),** **Isabel Avenue (Alt. 2)** BART would be extended to interface with Regional Rail in both alternatives, and the new intermodal station would replace Dublin/Pleasanton as a principal connectivity point.
Gilroy present Caltrain terminus	**Pajaro, Castroville** Gilroy would be joined by Pajaro and Castroville as connectivity points in the South Counties area.

Reorientation of Local Transit Networks

The introduction of rail transit services to areas currently not served by high-capacity, high-frequency modes will call for cutbacks or reorientation of local transit routes. The most significant changes are foreseen for the following areas:

<u>San Francisco, Presidio and Richmond District:</u>
New BART lines in Alternative 1 would terminate either at the Presidio or on Geary Boulevard. Some Golden Gate Transit service would terminate at the new Presidio or Park Presidio Boulevard BART Stations instead of continuing to downtown San Francisco. Service on Muni routes running parallel to the new BART lines would be cut back or reconfigured.

Alameda:
The new transbay tube in Alternative 1 with a stop in Alameda would be accompanied by a reorientation of some AC Transit service, having routes terminate at the new BART station rather than operating to Oakland. Direct ferry service between Alameda and San Francisco would also be cut back.

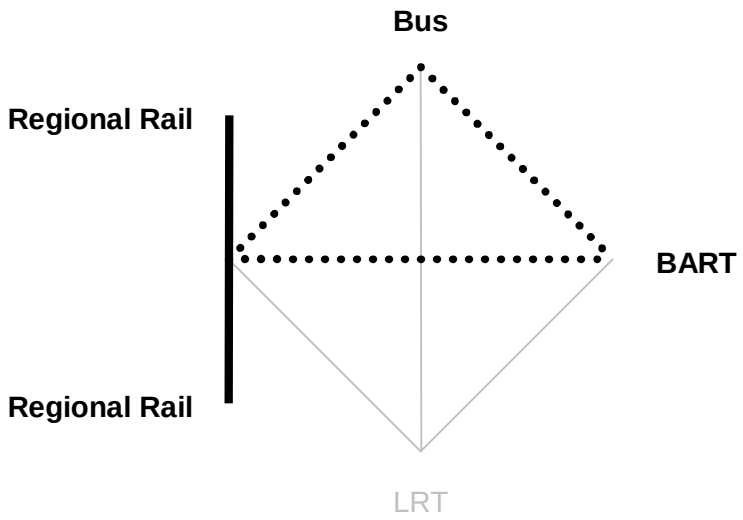
Santa Clara County:
Santa Clara Valley Transportation Authority (VTA) express service to/from Alameda County would be discontinued with the extension of BART to Milpitas, San Jose and Santa Clara. VTA routes would be reconfigured to serve the new BART stations, with Montague/Capitol, Alum Rock and Santa Clara Stations in particular as important hubs for connecting local bus services.

Principal Connectivity Points
(listed by distance then North-East-South-West)

The principal connectivity points of the future regional rail network are described on the following pages. Each includes at least one connectivity diagrams, to which the following key applies:

- - - - - - - - - -	extended walk or shuttle connection
• • • • • • • • •	concourse connection (horizontal and vertical component)
▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪	direct vertical connection (platform-to-platform, vertical component only)
▬▬▬▬▬	cross-platform transfer (no vertical or horizontal component)

Richmond



Richmond Station would incorporate the existing BART and Amtrak station. In Alternative 1, the following Regional Rail lines would serve the station, stopping at the existing Amtrak platform:

- Auburn/Sacramento ↔ San Jose via East Bay
- Oakland ↔ Merced via Martinez and Stockton

In Alternative 2, the following Regional Rail lines would serve the station, stopping at an expanded station with separate platforms for primary and secondary services:

- Auburn/Sacramento ↔ San Jose via Peninsula
- Santa Rosa ↔ Stockton

Bus stops and taxi drop-off/pick-up would remain in the same location as they are at the existing BART and Amtrak station, at 16th Street between Nevin and MacDonald Avenues.

Golden Gate Transit currently operates the following route at Richmond Station:

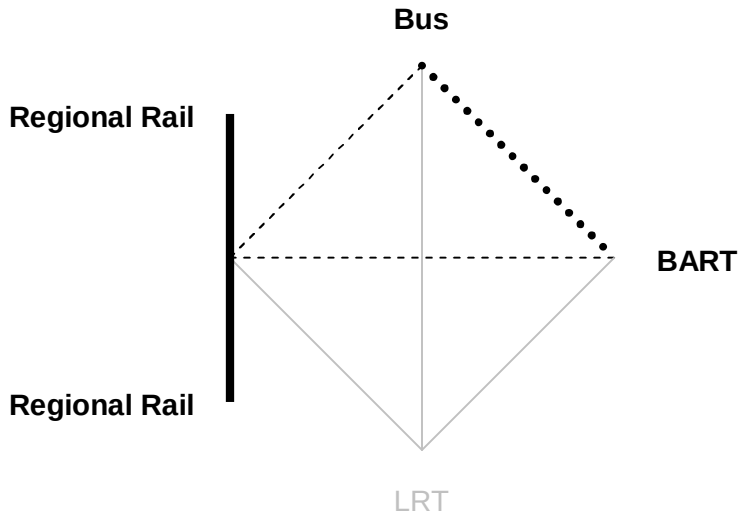
- 42 – provides service west across the Richmond-San Rafael Bridge to San Rafael, and east to El Cerrito del Norte BART Station

AC Transit currently operates the following bus routes at Richmond Station:

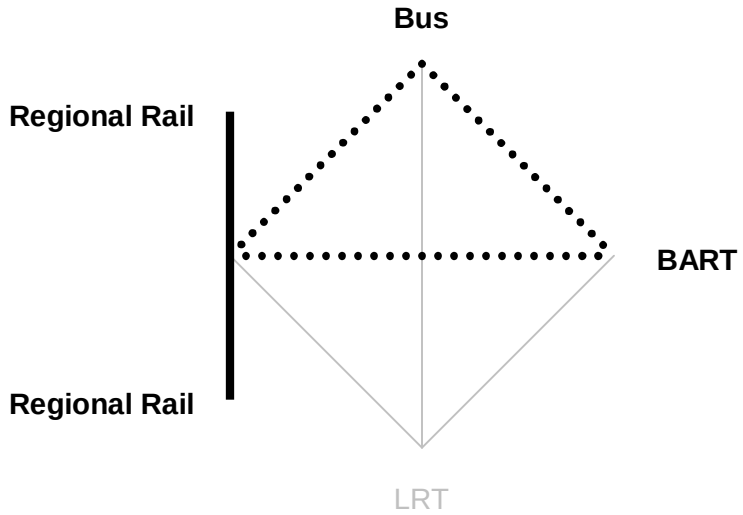
- 70 – provides service north to El Sobrante and Richmond Parkway Transit Center
- 71 – provides service north to San Pablo and Contra Costa College, and east to El Cerrito del Norte BART Station via Carlson Blvd.
- 72M – provides service west to Point Richmond via MacDonald Ave. and south on San Pablo Ave. to El Cerrito, Berkeley and Oakland
- 74 – provides service south to Marina Bay and north to San Pablo, Contra Costa College and Orinda
- 76 – provides service north to San Pablo, Contra Costa College and Hilltop Mall, and east to El Cerrito del Norte BART Station via Cutting Blvd.
- 376 – provides nighttime service similar to Route 76
- 800 – provides "All Nighter Service" to El Cerrito, Berkeley and Oakland

West Oakland

Alternative 1



Alternative 2



West Oakland Station would be built around the existing BART station. In Alternative 1, regional rail trains would stop at a platform three blocks south of the BART station on the other side of I-880. A peoplemover or moving sidewalk would connect the two station halves. The following Regional Rail lines would serve the station:

- Auburn/Sacramento ↔ San Jose via East Bay
- Oakland ↔ Merced via Martinez and Stockton
- Oakland ↔ Merced via Union City and Manteca

In Alternative 2, regional rail trains would stop in an underground station in the right-of-way of Seventh Street, connected via concourse to the BART station and to the underground passage described below. The following Regional Rail lines would serve the station:

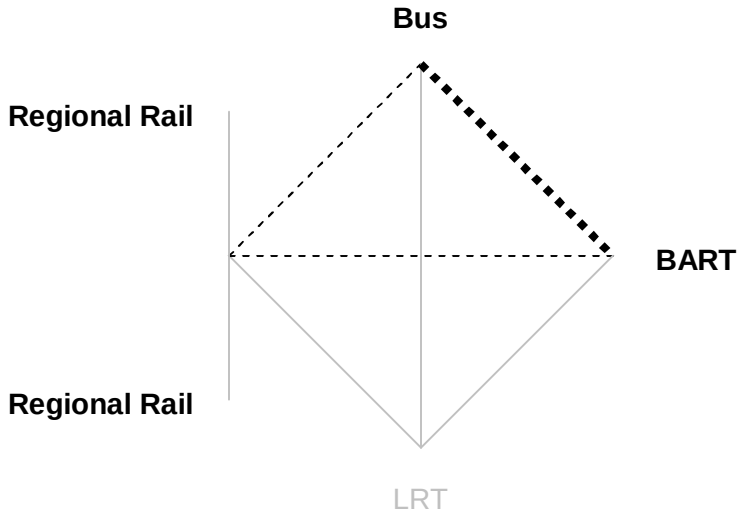
- Auburn/Sacramento ↔ San Jose via Peninsula
- Oakland ↔ San Jose via Milpitas
- Oakland ↔ San Jose via Dumbarton

Fifth Street between Center Street and Kirkham Street would be depressed to create a pedestrian mall at ground level. Bus stops and taxi drop-off/pick-up would be sited in this underground passage, which would have direct connections to/from I-880.

AC Transit currently operates the following bus routes at West Oakland station:

- 13 – provides service west along 7th St. to the Oakland Army Base, and north on Mandela Pkwy./east on 14th St. to downtown Oakland
- 19 – provides service north on Peralta St. into Emeryville, and east on 10th St. to downtown Oakland
- 800 – provides “All Nighter Service” to downtown Oakland, Berkeley and Richmond

Oakland Coliseum



Oakland Coliseum Station would expand upon the existing Amtrak station, which is connected to the BART station by an elevated walkway.

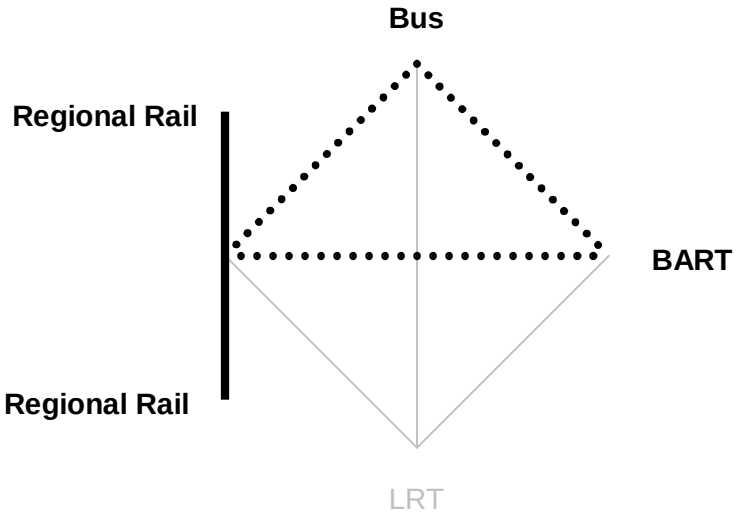
In Alternative 1, the following Regional Rail lines would serve the station:
- Auburn/Sacramento ↔ San Jose via East Bay
- Oakland ↔ Merced via Union City and Manteca

In Alternative 2, the following Regional Rail lines would serve the station:
- Oakland ↔ San Jose via Milpitas
- Oakland ↔ San Jose via Dumbarton

Taxi drop-off/pick-up would be sited on 73rd Avenue, adjacent to the regional rail station. Bus stops would be sited on both sides of the BART station, on San Leandro Boulevard and Snell Street.

AC Transit currently operates the following bus routes at Coliseum station:
- 13 – provides service west along 7th St. to the Oakland Army Base, and north on Mandela Pkwy./east on 14th St. to downtown Oakland
- 19 – provides service north on Peralta St. into Emeryville, and east on 10th St. to downtown Oakland
- 800 – provides “All Nighter Service” to downtown Oakland, Berkeley and Richmond

Union City



The Union City station would expand upon the existing Union City BART Station. Vehicular access to the BART side of the station would continue to be provided from Union Square. A new roadway running south from Decoto Road and on the east side of the BART and railroad alignment would provide access to the regional rail station. On either side, bus stops and taxi drop-off/pick-up would be sited at the southern end of the station.

In Alternative 1, the following Regional Rail lines would serve the station:
- Auburn/Sacramento ↔ San Jose via East Bay
- Oakland ↔ Merced via Union City and Manteca
- Union City ↔ Millbrae
- Union City ↔ San Jose

In Alternative 2, the following Regional Rail lines would serve the station:
- Oakland ↔ San Jose via Milpitas
- Oakland ↔ San Jose via Dumbarton

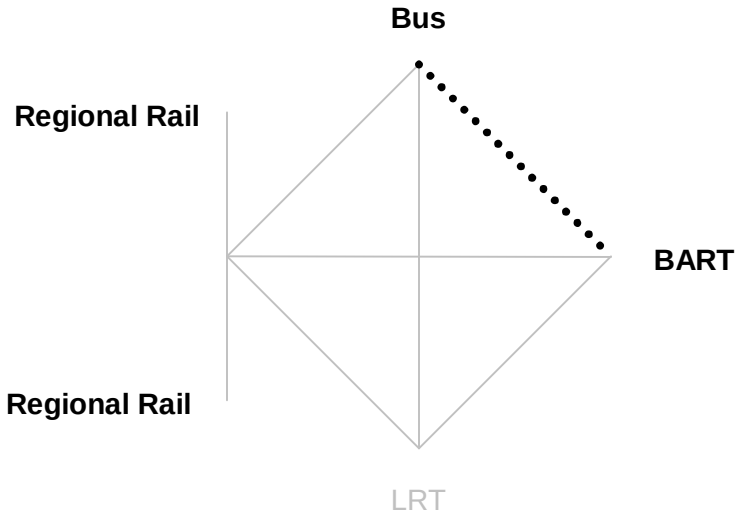
AC Transit and Union City Transit currently operate the following bus routes to the Union City BART Station. Routes 2, 99 and 801 would be routed to stop on the east side of the station; the rest would continue to stop on the west side of the station.
Union City Transit:
- 1 – provides service west to Union Landing and the Alvarado District
- 2 – provides service north through the Decoto District and west to Union Landing
- 3 – provides service west to Union Landing
- 4 – provides service south, west and north of the station to the Decoto District

AC Transit:
- 97 – provides service west through Union City north on Hesperian Boulevard through Hayward to Bay Fair BART Station
- 99 – provides service north on Mission Boulevard to Hayward BART Station
- 211 – provides service south on Fremont Boulevard to Fremont BART Station
- 214 – provides service west on Decoto Road to Newark and Newpark Mall, turning south and then east on Stevenson Boulevard to Fremont BART Station

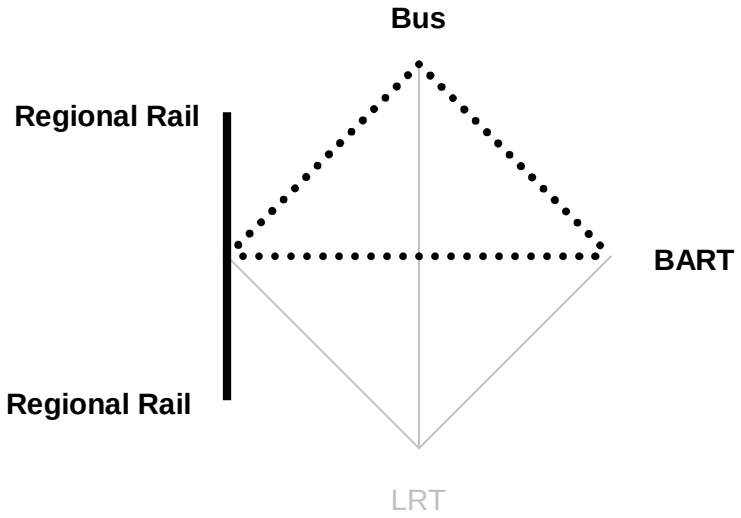
- 216 – provides service south on Alvarado-Niles Road to Fremont BART Station, and west to Newpark Mall
- 231 – provides service west on Decoto Road and south on Blacow Road to Fremont BART Station
- 232 – provides service west on Paseo Padre Parkway to Newark and Newpark Mall
- 332 – provides weekend service along Routes 216 and 232
- 801 – provides "All Nighter Service" to Fremont, Hayward, San Leandro and Oakland
- MA – provides service to Union Landing, Foster City, San Mateo and Hillsdale Mall

Irvington

Alternative 1



Alternative 2



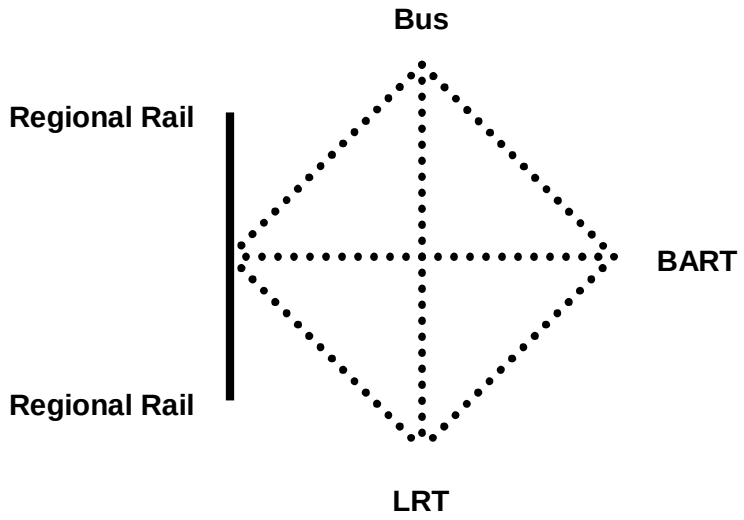
The Warm Springs Station would be located directly south of Grimmer Road and west of Warm Springs Boulevard. Vehicular access would be provided from Warm Springs Boulevard, with bus stops and taxi drop-off/pick-up sited directly east of the station.

In Alternative 1, Warm Springs would be a BART station only.

In Alternative 2, the following Regional Rail lines would serve the station:
- Oakland ↔ San Jose via Milpitas
- Oakland ↔ San Jose via Dumbarton

AC Transit currently operates Routes 215 and 218 to the station site. In addition, Routes 212 and 217 would be rerouted to serve the station.
- 212 – provides service north and south on Fremont Boulevard
- 215 – provides service north on Osgood Road and south on Warm Springs Boulevard
- 217 – provides service north on Mission Boulevard to Fremont BART Station and south on Warm Springs Boulevard to Milpitas
- 218 – provides service north on Grimmer Boulevard to Newark and east to Ohlone College

San Jose Diridon



The San Jose Diridon Station would expand upon the existing rail station. Vehicular access to the station would continue to be provided from Cahill Street. Bus stops and taxi drop-off/pick-up would also be sited on the east side of the station.

In Alternative 1, the following Regional Rail lines would serve the station:
- San Francisco ↔ San Jose/Salinas
- Union City ↔ San Jose
- Auburn/Sacramento ↔ San Jose via East Bay
- Sacramento ↔ San Jose

In Alternative 2, the following Regional Rail lines would serve the station:
- San Francisco ↔ Hollister
- Auburn/Sacramento ↔ San Jose via Peninsula
- Oakland ↔ San Jose via Milpitas
- Oakland ↔ San Jose via Dumbarton
- Sacramento ↔ Hollister

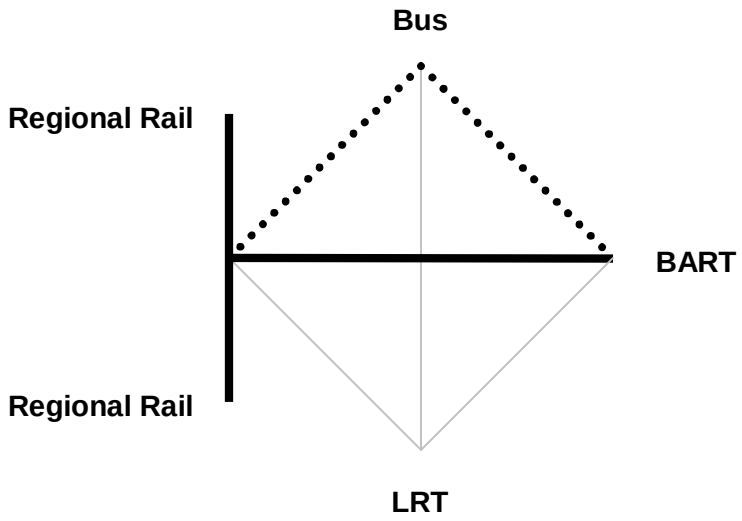
Santa Clara VTA currently operates light rail and bus service to the station as follows:

- 22 – provides service west on El Camino Real to Menlo Park and Palo Alto and east on Santa Clara Street to Eastridge Shopping Center
- 63 – provides service south on Meridian Avenue to Almaden Valley
- 64 – provides service east on Alum Rock Avenue and south on Lincoln Avenue
- 65 – provides service south on Leigh and Camden Avenues and Coleman Road
- 68 – provides service south on Monterey Road to Morgan Hill, San Martin and Gilroy
- 180 – provides express service to Fremont BART Station, which would be discontinued
- 305 – provides limited-stop service south on Monterey Road to South San Jose and north to Santa Clara, Sunnyvale and Mountain View
- 522 – provides rapid bus service along Route 22
- 804 (DASH) – circulates through downtown San Jose
- 902 – light rail service south to Campbell and north through San Jose, Santa Clara, and Sunnyvale to Mountain View
- HWY 17 – provides express service on Highway 17 to Scotts Valley and Santa Cruz

Monterey-Salinas Transit also currently operates the following route to San Jose Diridon Station, which would be discontinued when rail service in the corridor is implemented:

- 55 – provides service to Morgan Hill, Gilroy, Prunedale, Seaside and Monterey

Millbrae



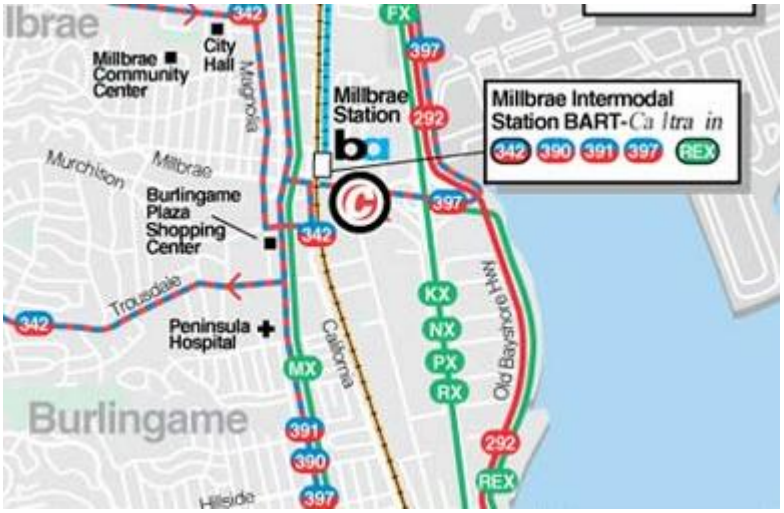
The Millbrae Intermodal Station would exist in essentially the same configuration as it does today. Vehicular access and taxi drop-off/pick-up are provided from Linden Avenue on the west side of the station and Garden Lane on the east side.

In Alternative 1, the following Regional Rail lines would serve the station:

- San Francisco ↔ San Jose/Salinas
- Union City ↔ Millbrae

In Alternative 2, the following Regional Rail lines would serve the station:

- San Francisco ↔ Hollister
- Auburn/Sacramento ↔ San Jose via Peninsula
- San Francisco ↔ Merced

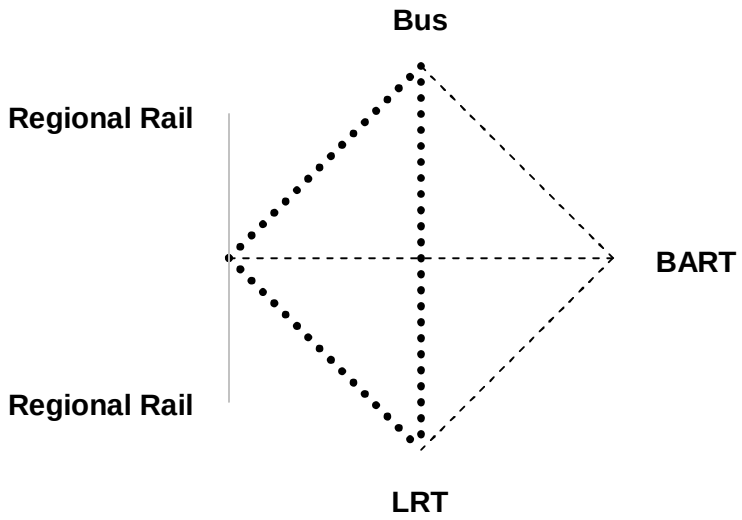


San Mateo County Transit District (SamTrans) operates the following bus routes to Millbrae Intermodal Station. Route 342 stops at the west-side bus bays, while all others stop at the east-side bus bays:

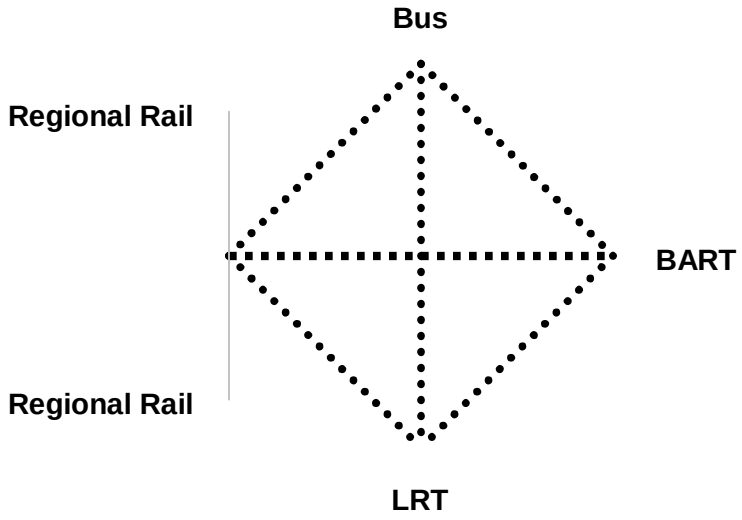
- 342 – circulates through downtown Millbrae and Millbrae Highlands
- 390 – provides local service on El Camino Real north to Daly City and south to Palo Alto
- 391 – provides limited-stop service north to San Francisco and local service south on El Camino Real to Redwood City
- 397 – provides service north to San Francisco on Bayshore Boulevard and south to Redwood City and Palo Alto
- REX – provides express service to Burlingame, San Mateo, Redwood Shores, Menlo Park and East Palo Alto

<u>Fourth & Townsend</u>

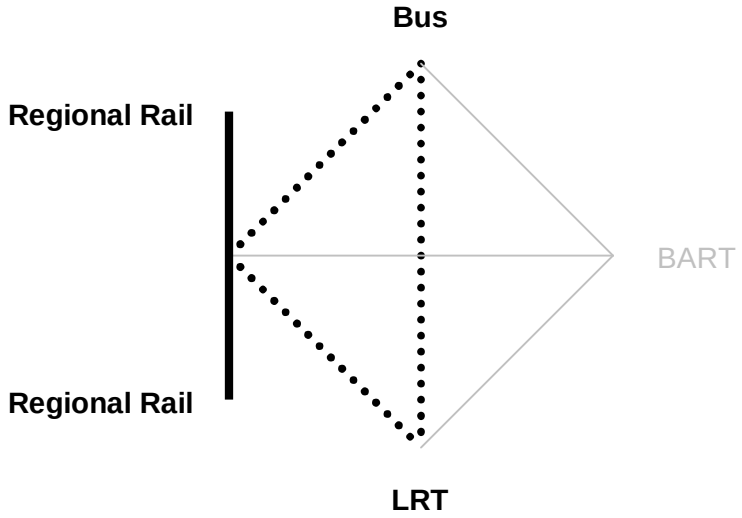
Alternative 1a



Alternative 1b



Alternative 2



Fourth & Townsend Station would incorporate the existing Fourth and King Caltrain Station. Regional Rail trains would either terminate at ground level in the existing station, or, if continuing to the Transbay Transit Terminal, would stop at a new underground station in the right-of-way of Townsend Street.

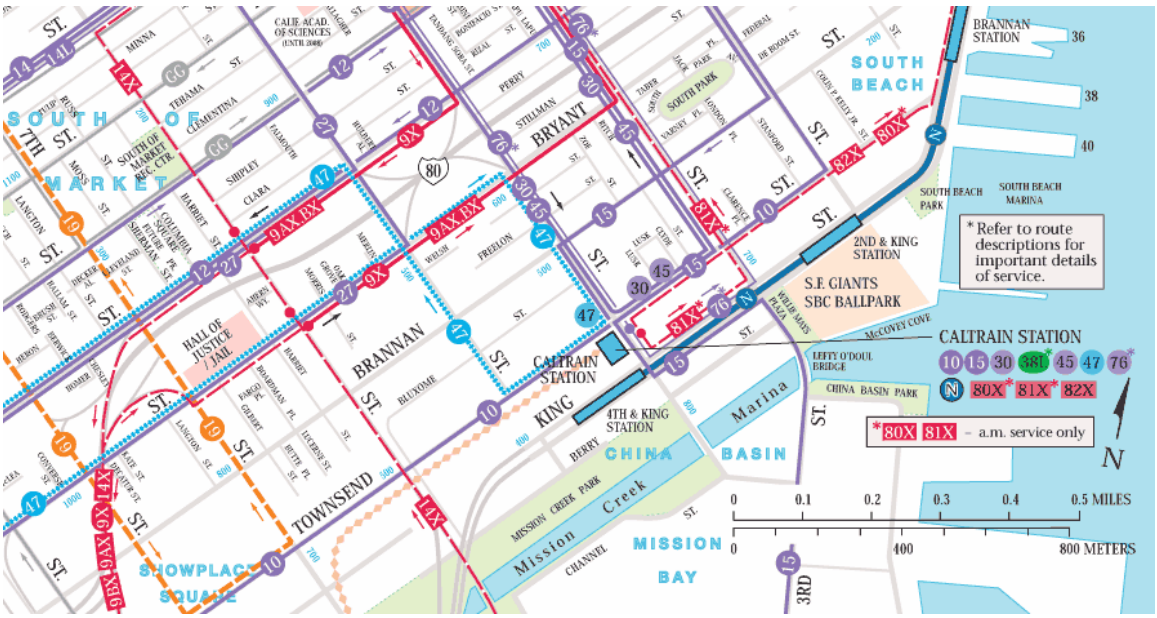
In Alternative 1, the following Regional Rail lines would serve the station:

- San Francisco ↔ San Jose/Salinas

In Alternative 2, the following Regional Rail lines would serve the station:

- San Francisco ↔ Hollister
- Auburn/Sacramento ↔ San Jose via Peninsula
- San Francisco ↔ Merced

Shuttle services and taxi drop-off/pick-up would be sited on Fourth Street between Townsend and King Streets.



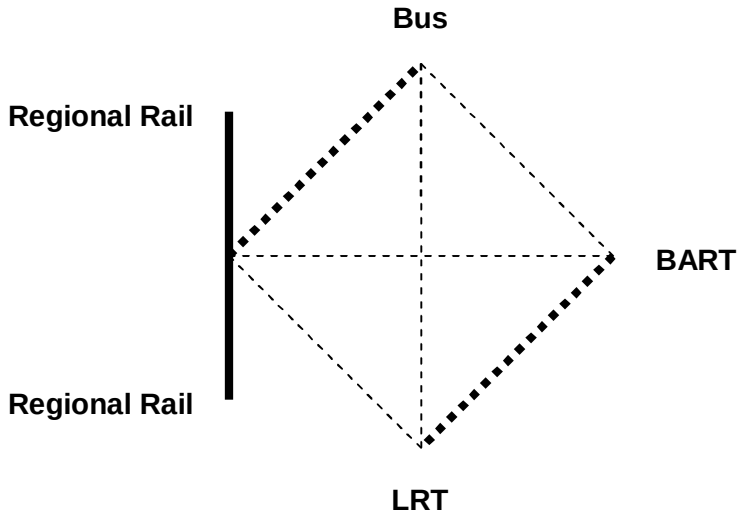
Muni currently operates the N Judah Metro line along King Street, one block south of the station site. This line provides service to AT&T Park, the south end of the Embarcadero, through downtown in the Market Street subway to Ocean Beach.

Starting in 2007, the T Third Metro line will operate south from the station site to the Mission Bay, Potrero Hill, Bayview/Hunters Point and Visitacion Valley neighborhoods. This line is planned to be extended north on Fourth Street into a new Central Subway and serve Union Square and Chinatown.

MUNI currently operates the following bus routes to Fourth & Townsend. Stops are located on both Fourth and Townsend Streets:

- 10 – provides service to Potrero Hill and through downtown to Aquatic Park
- 15 – provides service to Bayview and through downtown to North Beach
- 30 – provides service to the Marina through downtown and Chinatown
- 38L – provides service to the Richmond through downtown
- 45 – provides service to the Marina through downtown
- 47 – provides service to Fisherman's Wharf through Civic Center
- 76 – provides service to the Marin Headlands through downtown
- 80X – provides express service to downtown in the AM peak
- 81X – provides express service to downtown in the AM peak
- 82X – provides express service to the Presidio through downtown

Transbay Transit Center



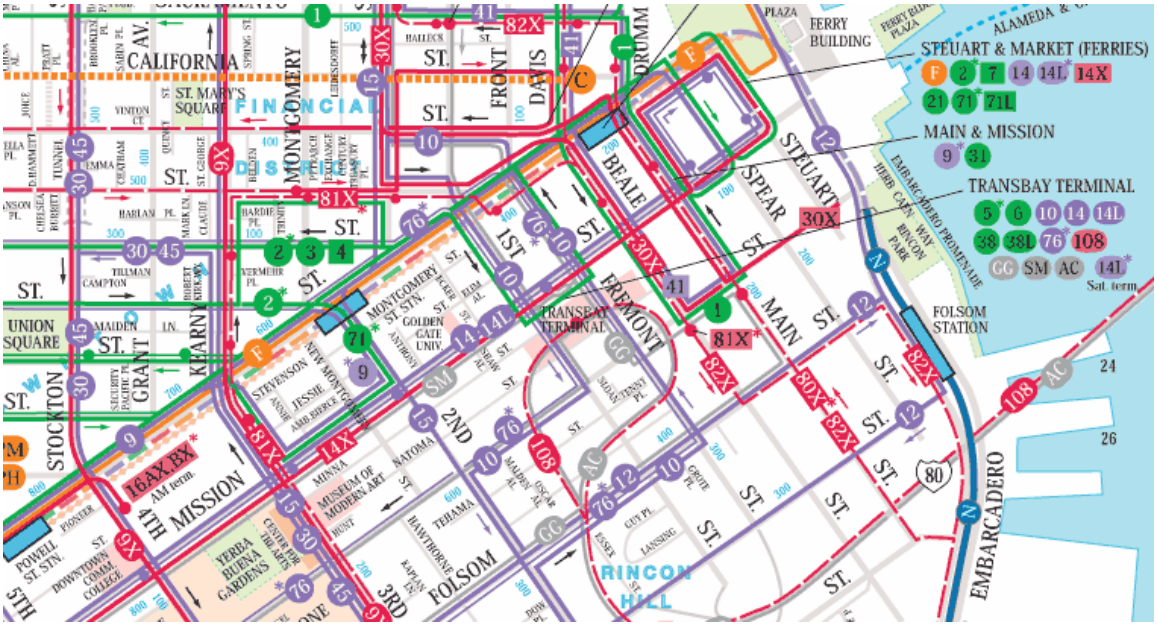
The Transbay Transit Center would be the premier transit facility of the Bay Area, occupying the site of the current Transbay Terminal on the block surrounded by First, Fremont, Howard and Mission Streets in downtown San Francisco.

In Alternative 1, the following Regional Rail lines would serve the station:

- San Francisco ↔ San Jose/Salinas

In Alternative 2, the following Regional Rail lines would serve the station:

- San Francisco ↔ Hollister
- Auburn/Sacramento ↔ San Jose via Peninsula
- San Francisco ↔ Merced



Four transit providers operating about three dozen bus routes currently provide service to the Transbay Terminal:

- **Muni**: The San Francisco Municipal Railway (Muni) operates ten routes providing local service within San Francisco. With the exception of Route 108, providing service across the Bay Bridge to Treasure Island, Muni routes stop in front of the existing Transbay Terminal or on surrounding streets.

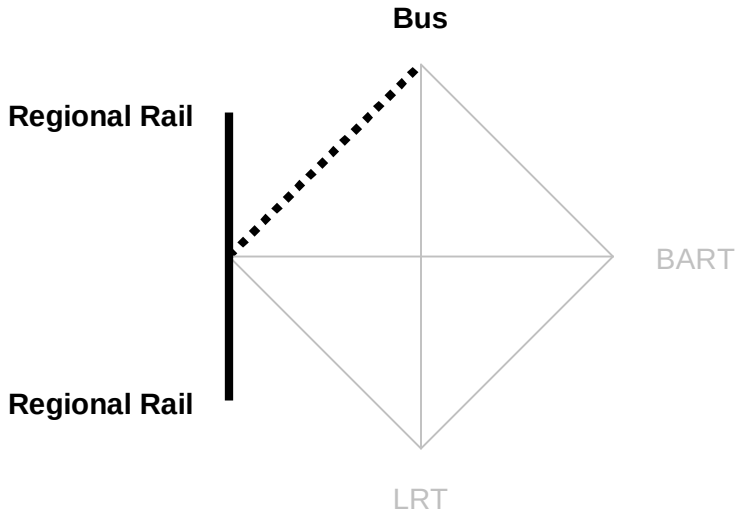
- **AC Transit**: AC Transit operates two dozen bus routes across the Bay Bridge, connecting East Bay neighborhoods with downtown San Francisco. With the exception of four routes that operate all day, AC Transit's service is largely directional and focused during commute times. AC Transit routes stop inside the existing terminal, which they access the Bay Bridge via exclusive bus-only ramps.

- **SamTrans**: Some ten routes connect San Francisco with destinations in San Mateo County, serving the Transbay Terminal with stops on Mission Street. Only two routes actually terminate at the existing terminal.

- **WestCAT**: The Western Contra Costa Transit Authority operates one route across the Bay Bridge between Hercules and the Transbay Terminal.

- **Golden Gate Transit**: The Golden Gate Bridge, Highway and Transportation District operates several routes across the Golden Gate Bridge between Marin County and San Francisco, stopping adjacent to the Transbay Terminal.

Napa Junction



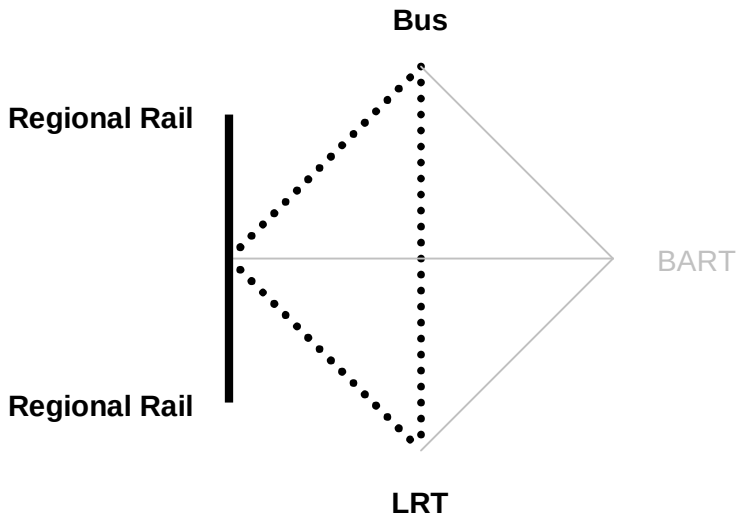
The Napa Junction Station would be located under the Broadway Street (Highway 29) overpass. Broadway Street would provide vehicular access, with bus stops and taxi drop-off/pick-up sited on the overpass along the street.

In both Alternatives, the following Regional Rail lines would serve the station:
- San Rafael ↔ Fairfield/Vacaville
- Saint Helena ↔ Vallejo

Napa County Transportation Planning Agency (VINE) operates the following bus route along Highway 29:

- 10 – provides local service north to Calistoga and south to Vallejo

Sacramento



Sacramento Station would be based on the existing Amtrak station, which is planned to be reconfigured and slightly shifted to the north.

In Alternative 1, the following Regional Rail lines would serve the station:

- Auburn/Sacramento ↔ San Jose via East Bay
- Sacramento ↔ Merced via Stockton (BNSF)
- Sacramento ↔ Merced via Stockton (UPRR)
- Sacramento ↔ San Jose

In Alternative 2, the following Regional Rail lines would serve the station:

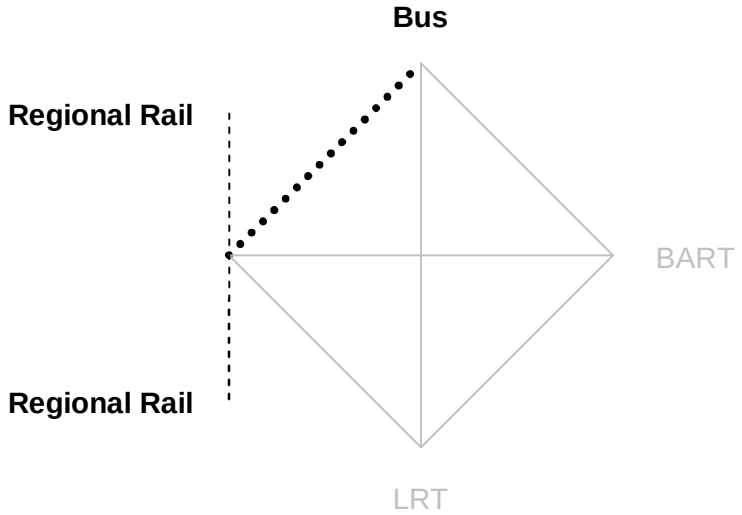
- Auburn/Sacramento ↔ San Jose via Peninsula
- Sacramento ↔ Merced via Stockton (BNSF)
- Sacramento Merced via Stockton (UPRR)
- Sacramento ↔ Hollister

Bus stops and taxi drop-off/pick-up would remain in the same location as they are at the existing Sacramento Valley Station, north of the historic depot and west of 5th Street. Sacramento Regional Transit (RT) currently operates light rail and bus service to the station as follows:

- Light Rail Gold Line – operates through downtown Sacramento to eastern Sacramento, Rancho Cordova and Folsom
- 15 – operates north to the North Sacramento and Arcade neighborhoods
- 30, 31 – operates east to the Cal State University Sacramento campus

<u>Stockton</u>

Alternative 1

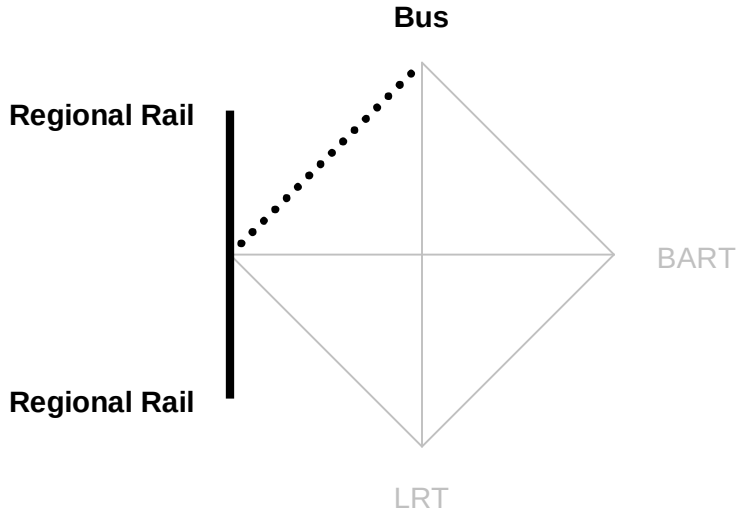


In Alternative 1, Stockton would have two stations, the Robert J. Cabral Station with platforms for north-south trains centered on downtown's Weber Avenue, and a new station with platforms for east-west trains some nine blocks south in the Taylor Street right-of-way (east of the existing San Joaquin Street Station). A dedicated shuttle would connect the two stations, and bus stops would be located at each. The bus stops and taxi drop-off/pick-up at the Cabral Station would be sited on Union Street between Miner Avenue and Channel Street, and for the new east-west station on a loop created in the Aurora Street right-of-way south of Scotts Avenue.

The following Regional Rail lines would serve the Cabral Station:
- Sacramento ↔ Merced via Stockton (BNSF)
- Sacramento ↔ Merced via Stockton (UPRR)
- Sacramento ↔ San Jose

The following line would serve the new east-west station:
- Oakland ↔ Merced via Martinez and Stockton (BNSF)

Alternative 2



In Alternative 2, Stockton would be served by the Cabral Station only. The following Regional Rail lines would serve the station:
- Santa Rosa ↔ Stockton
- Sacramento ↔ Merced via Stockton (BNSF)
- Sacramento Merced via Stockton (UPRR)
- Sacramento ↔ Hollister

San Joaquin Regional Transit District operates several bus routes in downtown Stockton. These routes could be rerouted to serve the station(s) as follows:

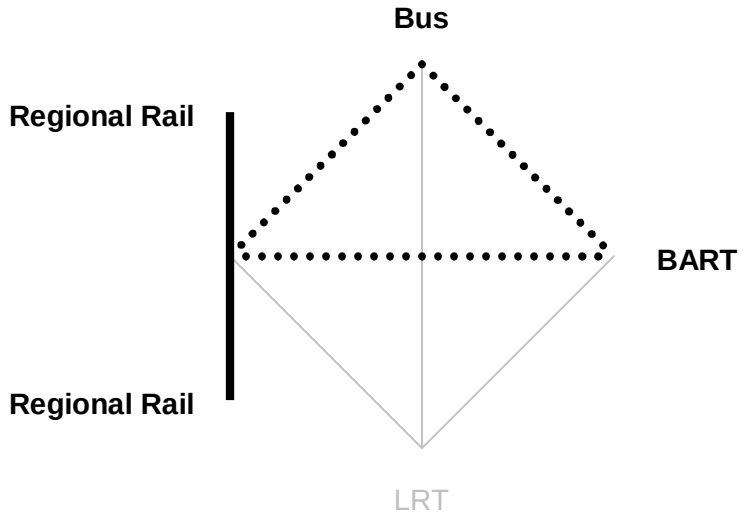
Cabral Station:
- 4 – operates north on Wilson Way
- 10 – operates north on Pacific and Pershing Avenues; south on California Street
- 11 – operates north on Pershing Avenue; south on Wilson Way and east on 8th St.
- 17 – operates north on Cherokee Road
- 18 – operates east to Eastland Plaza, south to existing San Joaquin Street Station
- 26 – operates south to Lathrop, Tracy, Manteca and Ripon
- 32 – operates north on Filbert Street and east on Main Street

- 37 – operates west on Country Club Boulevard and Monte Diablo Avenue

East-West Station:
- 1 – operates north on El Dorado Street
- 5 – operates north on El Dorado Street; south to the county fairgrounds
- 10 – operates north on Pacific and Pershing Avenues; south on California Street
- 16 – operates north on Pacific Avenue and west on Benjamin Holt Drive; south to the county hospital and county jail
- 18 – operates east to Eastland Plaza, south to existing San Joaquin Street Station
- 23 – operates north to Lodi
- 26 – operates south to Lathrop, Tracy, Manteca and Ripon
- 35 – operates north on West Lane; south to the county hospital and county jail

Livermore

Alternative 1 (Greenville Road)



The location of an intermodal Regional Rail / BART station in Livermore would be sited at Greenville Avenue on the city's eastern edge in Alternative 1, or at Isabel Avenue on the west side of the city in Alternative 2.

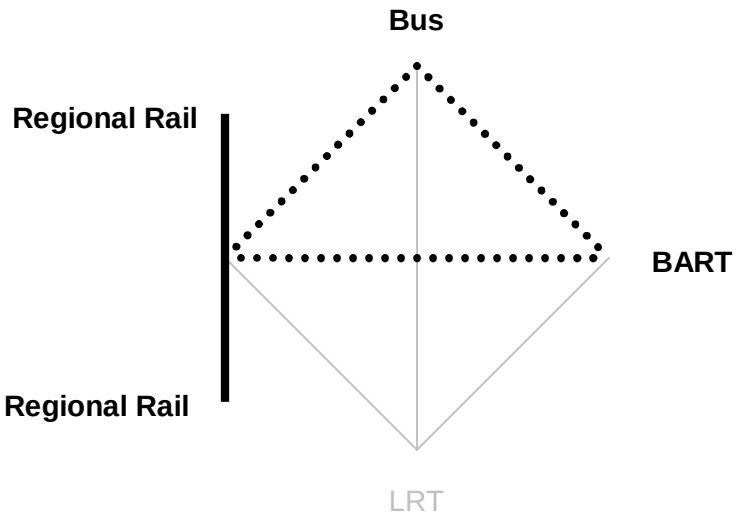
In Alternative 1, Greenville Road would provide vehicular access to the station, which would be sited east of the road and south of I-580. Bus stops and taxi drop-off/pick-up would be sited immediately west of the station. The following Regional Rail lines would serve the station:
- Sacramento ↔ San Jose
- Oakland ↔ Merced via Union City and Manteca

Wheels currently operates the following bus route in the vicinity of Greenville Road:

- 20 – operates south to Lawrence Livermore National Laboratory and west on Mines Road, terminating at Dublin/Pleasanton BART Station

Additional routes that currently serve the downtown Livermore Transit Center may be routed to the station as well.

Alternative 2 (Isabel Avenue)



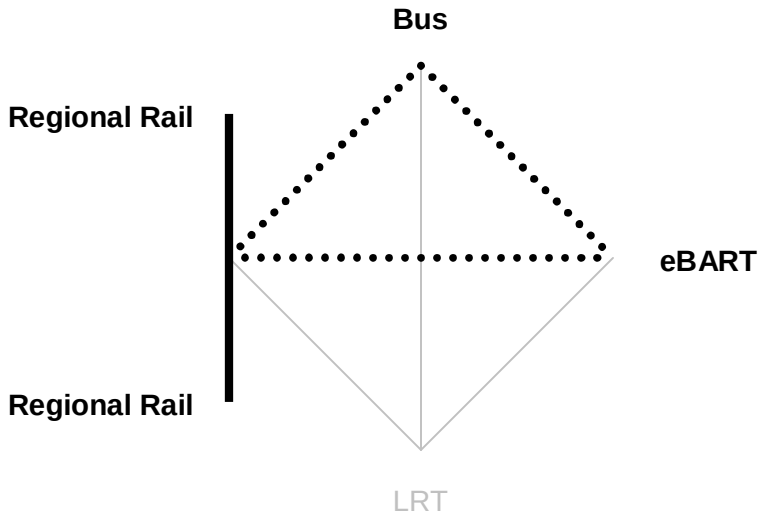
In Alternative 2, Stanley Avenue would provide vehicular access to the station, sited immediately west of Isabel Avenue. Through traffic would travel under an elongated circulation plaza between the rail station and the bus/coach station and parking opposite. Lanes in both travel directions would connect Stanley Avenue to and from the station plaza on both of its sides. Taxi drop-off/pick-up would be accommodated along the circulation plaza, and buses would stop at the bus/coach station on the south side of the plaza.

Wheels currently operates the following bus route in the vicinity of Isabel Avenue:

- 10 – operates east to downtown Livermore and Vasco Road, and west to Pleasanton, Dublin and Stoneridge Mall

Additional routes that currently serve the downtown Livermore Transit Center may be routed to the station as well.

Tracy



Tracy Station would be based on the existing Altamont Commuter Express (ACE) Station. In both alternatives, eBART would serve the station.

In Alternative 1, the following Regional Rail lines would serve the station:

- Sacramento ↔ San Jose
- Oakland ↔ Merced via Union City and Manteca

In Alternative 2, the following Regional Rail lines would serve the station:

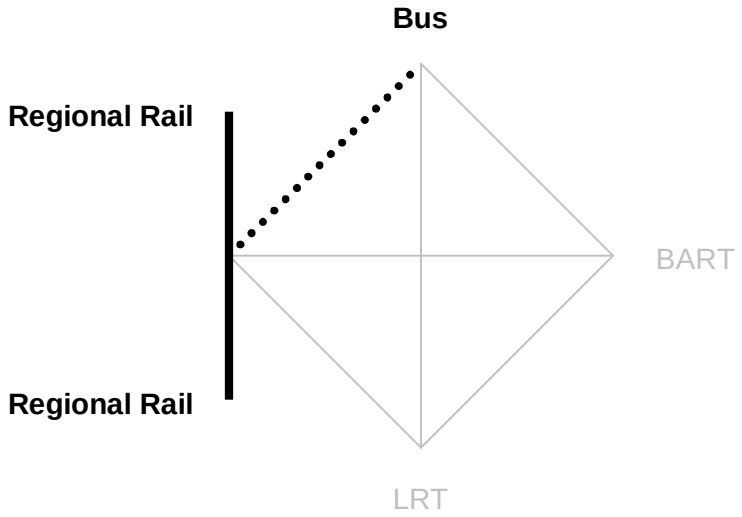
- Sacramento ↔ Hollister
- San Francisco ↔ Merced via Dumbarton

Bus stops and taxi drop-off/pick-up would be sited on a loop road off of West Sixth Street between B and C Streets.

San Joaquin Regional Transit District operates Route 26 between Tracy, Lathrop, Stockton, Manteca and Ripon. The route's current terminus at East and Tenth Streets would be extended to the regional rail station.

The City of Tracy operates a fixed route bus service, Tracer, within the city. Tracer would be routed to serve the regional rail station.

Modesto



The Modesto Station would be sited between 8th and 9th I and L Streets in downtown Modesto, and vehicular access would be provided from 9th Street. A bus station and taxi drop-off/pick-up would be located on 9th Street between I and J Streets, the site of the existing Downtown Transportation Center.

In Alternative 1, the following Regional Rail lines would serve the station:
- Sacramento ↔ Merced via Stockton (UPRR)
- Oakland ↔ Merced via Union City and Manteca

In Alternative 2, the following Regional Rail lines would serve the station:
- Sacramento ↔ Merced via Stockton (UPRR)
- San Francisco ↔ Merced via Dumbarton

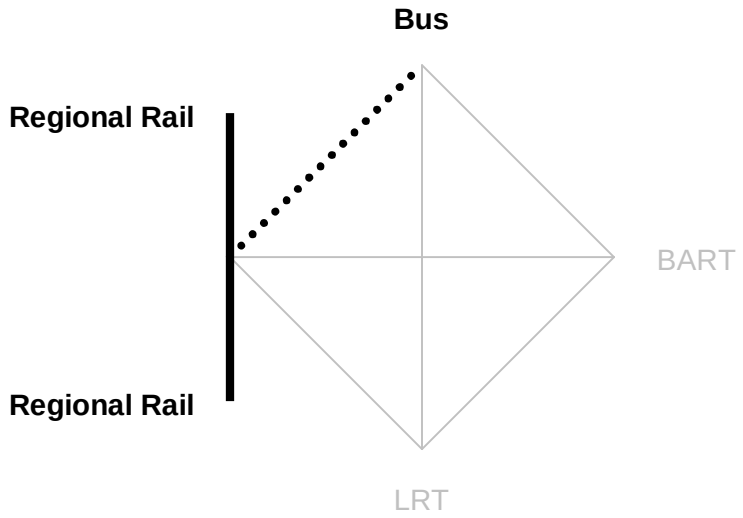
Modesto Area Express (MAX) currently operates the following bus routes to the Downtown Transportation Center:
- 21 – provides service southwest on Paradise Road
- 22 – provides service north on McHenry Avenue and west on Standiford Avenue

- 24 and 34 – provide service on a loop northwest of downtown
- 25 – provides service east on Yosemite Boulevard and west on Orangeburg Avenue
- 26 – circulates west of downtown on California Avenue and Maze Boulevard
- 27 – provides service north on College and McHenry Avenues
- 29 – provides service on a loop southwest of downtown
- 30 – provides service north on Carver Road to Vintage Faire Mall
- 32 – provides service north on Coffee Road
- 33 – provides service west to Modesto Junior College
- 36 – provides service north on Carpenter and Sisk Roads
- 37 – provides service north on Oakdale Road and west on Sylvan Avenue
- 38 – provides service east to the Airport neighborhood
- 39 – provides service east on Yosemite Boulevard to Empire
- 41 – provides express service to Vintage Faire Mall
- 42 – provides service south on Crows Landing Road

Stanislaus Regional Transit (StaRT) also currently operates the following bus routes to the Downtown Transportation Center:

- 10 – provides express service between Modesto and Turlock, which would be discontinued once regional rail is implemented
- 15 – provides local service between Modesto and Turlock
- 40 – provides service south and west to Grayson, Westley and Patterson
- 60 – provides service north and east to Riverbank and Oakdale

Merced



The Merced Station would be sited at the current Merced Transpo Center, between 15th and 16th and M and P Streets in downtown Merced. Vehicular access would be provided from 16th Street, with a bus station and taxi drop-off/pick-up sited on 16th Street between O and P Streets.

In Alternative 1, the following Regional Rail lines would serve the station:

- Sacramento ↔ Merced via Stockton (UPRR)
- Oakland ↔ Merced via Union City and Manteca

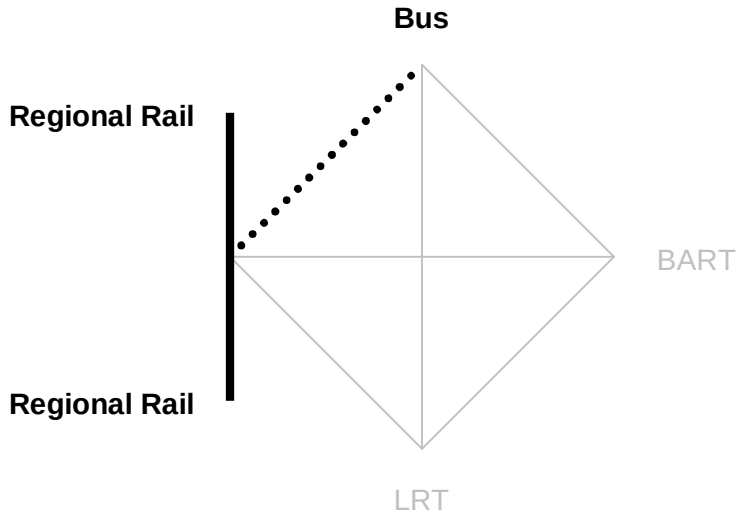
In Alternative 2, the following Regional Rail lines would serve the station:
- Sacramento ↔ Merced via Stockton (UPRR)
- San Francisco ↔ Merced via Dumbarton

Merced County Transit currently operates the following bus routes to Merced Transpo Center:
- 1 and 2 – "City Shopper" circulating through Merced
- 3 – provides service north and south along M Street
- 4 – provides service north to Merced College and south to Merced Community Hospital
- 5 – provides service to southeast Merced
- 5X – provides service to Human Services Agency and Valley High School
- 7 – provides service to Atwater, Winton, Livingston, Delhi and Turlock
- 9 – provides service to Planada and Le Grand
- 10 – provides service to Dos Palos and Los Banos
- 12 – provides service north on R Street to Merced College

CatTracks, the transit system of the University of California, Merced, also currently operates the following bus routes to Merced Transpo Center:
- E Line – circulates through downtown and connects to the campus
- NITE CAT – provides late night service between downtown and the campus

YARTS, the Yosemite Area Regional Transportation System, operates bus service on Highway 140 between Merced Transpo Center and Yosemite Valley.

Pajaro



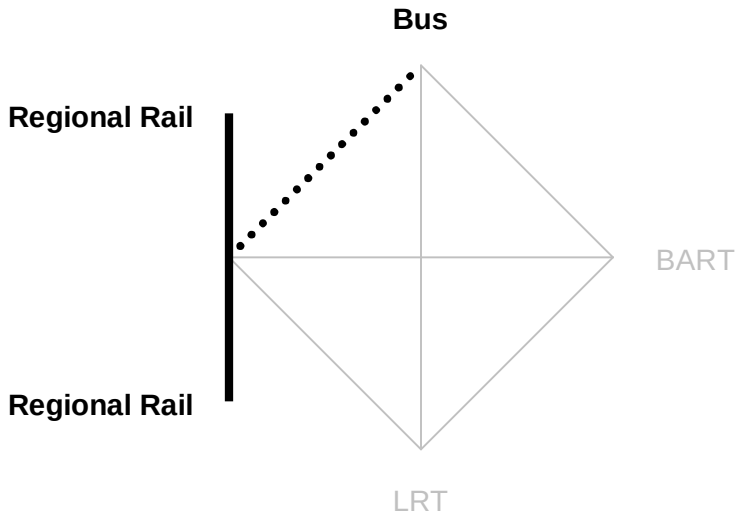
The Pajaro Station would be located immediately south of a new wye at Watsonville Junction. Vehicular access would be provided from Salinas Road between Railroad Avenue and Lewis Road, with bus stops and taxi drop-off/pick-up sited directly west of the station.

In Alternative 1, the following Regional Rail lines would serve the station:
- San Francisco ↔ Salinas
- Santa Cruz ↔ Monterey

In Alternative 2, the following Regional Rail lines would serve the station:
- Gilroy ↔ Salinas
- Santa Cruz ↔ Monterey

Monterey-Salinas Transit currently operates two routes to the station site:
- 28 – provides service north to Watsonville and south to Moss Landing and Castroville
- 29 – provides service north to Watsonville and south to Prunedale and Salinas

Castroville



The Castroville Station would be located on the east side of town north of Highway 156. Vehicular access would be provided from Benson Road, with bus stops and taxi drop-off/pick-up sited directly west of the station.

In Alternative 1, the following Regional Rail lines would serve the station:
- San Francisco ↔ Salinas
- Santa Cruz ↔ Monterey

In Alternative 2, the following Regional Rail lines would serve the station:
- Gilroy ↔ Salinas
- Santa Cruz ↔ Monterey

Monterey-Salinas Transit currently operates two routes in the vicinity of the station site:
- 27 – provides service north to Watsonville and south to Marina
- 28 – provides service north to Watsonville and east to Salinas